

MEN'S SOCIO-DEMOGRAPHIC BACKGROUND
AND MATERNAL HEALTH CARE UTILIZATION IN ETHIOPIA

Miia Paavilainen

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University of Tampere

School of Health Sciences

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Supervisor: Professor Matti Salo

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Maternal health care utilization in Ethiopia is very low which is reflected in high maternal mortality. Ethiopian men are known to have a strong influence on partner's health care seeking behavior but how men's socio-demographic background is associated with service use is largely unclear. Involving men in promoting partner's reproductive health is considered as an effective means in patriarchal societies and it can be combined with enhancing women's status. Tracking the characteristics that are connected to utilization of maternity services helps to target the interventions correctly.

This study aims to reveal how male partners' socio-demographic background is associated with women's maternal health care seeking behavior, measured by antenatal and delivery care utilization, as well as with their own participation in antenatal check-ups, and to find out the possible differences in the background characteristics that shape the use of delivery care in urban and rural areas. To this end, 4 206 Ethiopian men aged 15-59 years were studied using the data from Ethiopia Demographic and Health Survey 2011. Descriptive analyses, univariate and multivariate binary logistic regression were conducted, the latter enabling to control for confounding of the explanatory variables (age, marital status, number of children, educational level, occupation, wealth, religion, ethnicity, type of place of residence and vehicle in the household).

According to men, 57 % of their partners had had at least one antenatal visit and 12 % had delivered in an institute. Among men whose partners used antenatal care, 43 % participated in antenatal visits. Low number of children, higher educational level, better wealth and urban type of residence were associated with more frequent service utilization. In addition, occupation and ethnicity turned out to be independent predictors. Partly different factors seemed to contribute to partner's institutional delivery in urban and rural areas.

Men's socio-demographic characteristics are strongly connected to maternal health care utilization in Ethiopia. Raising men's awareness is essential. Men should be integrated into reproductive health programs and targeted in all sectors when planning solutions to this life-threatening problem.

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Abbreviations

ANC	Antenatal Care
CI	Confidence Interval
DHS	Demographic and Health Survey
EDHS	Ethiopia Demographic and Health Survey
HEP	Health Extension Program
HIV	Human Immunodeficiency Virus
MDGs	Millennium Development Goals
MMR	Maternal Mortality Ratio
OR	Odds Ratio
PMTCT	Prevention of Mother to Child Transmission of HIV
SPSS	Statistical Package for the Social Sciences
UN	The United Nations
UNDP	United Nations Development Program
UNFPA	United Nations Population Fund
USAID	United States Agency for International Development
WHO	The World Health Organization

1. Introduction

“We stay at our home and we give birth, by the time they tell us of complications, it is already dangerous ... we just die, we do not have an option because we cannot afford to pay for a car to take us to hospital.” -woman from Amhara [Ethiopia]

“If my husband does not have money, he may say ‘why should I take you to a facility’, out of ignorance. He will take me there only when the illness becomes serious or when I am close to death. If we had a facility here, I could just go without telling him and tell him to pay after I get treated.” - woman from Amhara

“If a mother is in this kind of situations [delivery complications], her only hope is to pray to god. It is rather better than going to a hospital.” [-Ethiopian woman, background unknown]

These extracts are from a study exploring delivery-related practices and beliefs in Ethiopia (Warren, 2010). They tell how traditional practices, economical constraints, lack of awareness, long distances and religious attitudes influence maternal health care seeking in a country, where maternal mortality is as high as 676 per 100 000 live births according to the worst estimates, one of the highest in the world (CSA & ICF, 2012). At the same time, the utilization of maternal health services is among the lowest in the world (WHO, 2013c). Even though other poverty-related problems influence the mortality, there is evidence that good quality maternal health care, especially delivery care, is essential in reducing the deaths and otherwise promoting women's health (De Brouwere, et al., 1998; Graham, et al., 2001; WHO, ICM & FIGO, 2004).

Maternal health care utilization is particularly low in rural areas of Ethiopia, where the vast majority, 84 %, of the country's 86,5 million people reside. While 50 % of births in urban areas take place in health facilities, this is true of only 4 % of births in rural areas. (CSA & ICF, 2012) Among rural

population, the problem is not only the lack of health services but also traditional practices such as child marriage and female genital mutilation, which are more common than among urban population and contribute to risk pregnancies. Luwei Pearson, chief of the health section at the UNICEF in Ethiopia comments: “Reducing maternal deaths, especially in rural areas, will require not just medical care but a whole societal engagement. Significant would be reducing early pregnancies, early marriages, and ensuring that health facilities are accessible.” (IRIN, 2013)

It is not only the woman herself who decides whether to seek professional care or not. In countries like Ethiopia where conservative gender norms prevail, the husband is the one to have the most powerful say even to woman’s health care use (CSA & ICF, 2012). According to the qualitative study by Warren (2010), also the decision about the location for the birth is usually made by the husband (or partner). In addition, other extended family members like mother-in-law and sister-in-law might get involved in the decision-making.

The purpose of this study is to find out how men’s socio-demographic background is connected to their partners maternal health care utilization in Ethiopia, which has been studied only limitedly. Three components of maternal health care will be focused: women’s antenatal care utilization, delivery care utilization and men’s participation in antenatal visits. The most recent Ethiopia Demographic and Health Survey (EDHS), a comprehensive survey emphasizing sexual and reproductive health issues, will be used as the data source.

Improving women’s and children’s health and reducing mortality is a complex thing which does not depend only on health care. Nevertheless, raising husbands’ and partners’ awareness of the importance of maternal health care in patriarchal societies is surely one effective means among others and thus, more evidence about men’s influence is needed.

2. Literature review

Maternal health care system is created to promote women's, children's and whole the family's health and wellbeing in all the phases of pregnancy and childbirth. That is why the review starts with giving a brief overview of maternal health and its main indicator. Next, the origin of the maternal health care is shed light on and the different components of maternal health care are presented. The levels and trends of maternal health service utilization will be looked at before going on to review the studies where the determinants of maternal health care utilization have been examined.

The power issues concerning household decision-making are discussed next because they make the important link between my study components. The concept of women's empowerment will be also presented as it has been and still is an important development method, and closely connected to the more recent idea of involving men to gain better reproductive health outcomes. Finally, the male involvement aspect is explained and the few studies done on the similar topics to mine are reviewed.

The literature search for this review was unsystematic and it was conducted mainly with the help of Ovid Medline search engine. Also Google browser was used to find relevant articles and publications on the topic.

2.1. Maternal health

Maternal mortality is considered the main indicator of maternal health (Geller, et al., 2006). Although not a wide public health problem in high-income countries, maternal mortality continues to be unacceptably high in many low-income settings. In fact, in the poorer countries pregnancy and childbirth are still the leading causes of death and disability among women of reproductive age (WHO, 2005). Nearly all, 99 % of maternal deaths take place in developing countries; more than half in sub-Saharan Africa and about one third in South Asia (WHO, 2012). When adjusted to number of births, a marked difference between richer and poorer areas still remains, suggesting that maternal mortality is closely linked to other development problems.

The World Health Organization (WHO) defines maternal death as *“the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes”* (WHO, 2013d) whereas maternal health refers to the health of a woman during pregnancy, childbirth and the postpartum period (WHO, 2013a). Improving maternal health is one of the Millennium Development Goals (MDGs) launched in 2000 and it is the goal lagging most from its target. The countries of the international community have engaged to reduce maternal mortality by three quarters from 1990 to 2015. In 2010 there were about 287 000 maternal deaths worldwide which is nearly half of that in 1990 but the target is still very far for many regions – too far to be reached by 2015 (WHO, 2011). In addition, the progress has been uneven, the slowest change having taken place in regions with initially highest burden of deaths, except of southern Asia. The maternal mortality ratio (MMR), the number of maternal deaths per 100 000 live births, was 15 times higher in developing regions compared to developed regions in 2010, sub-Saharan Africa having the worst figure, 500 per 100 000 live births. One important difference between the areas in the opposite ends of the scale is the coverage of skilled attendants at birth: In the areas with highest mortality, the coverage of births attended by skilled personnel is the lowest. (UN, 2012)

For Ethiopia, the MMR estimates vary from 350 in 2010 (WHO, 2013c) to 676 in 2011 (CSA & ICF, 2012) depending on the data source. According to the latter EDHS data, the ratio has remained effectively the same since 2000. This big discrepancy in the mortality data between different sources is due to the lack of proper vital registration systems and thus, the figures are only rough estimates. Maternal mortality is especially difficult to estimate because it is statistically rare event and therefore a large sample is required. Alternatively, a modeled estimate has to be constructed if no survey has been conducted, and it is even more inaccurate method. (WHO, 2005)

Globally, 80 % of the maternal deaths occur due to complications arising during pregnancy, delivery or the puerperium. Those complications; severe bleeding, infections, high blood pressure and unsafe abortion are largely preventable and treatable and thus, most maternal deaths could be avoided. (WHO, 2012) Good quality maternal health care, comprising of antenatal, delivery and postnatal services, essentially promotes mother’s and child’s wellbeing and helps to prevent severe complications and illnesses, even death (Burchett & Mayhew, 2009; Carroli, et al., 2001; WHO, 2013a; WHO, 1999).

2.2. Maternal health care

2.2.1. History

The roots of maternal health care system are in the late nineteenth century Europe where the pioneering clinics were established. The ill-health of mothers and children evoked concerns, especially in France and Britain, about the economic and military aspirations to be threatened as recruiting strong and healthy soldiers had resulted difficult. By the beginning of the 20th century, most industrialized countries and their colonies had launched the first maternal and child health programs, Finland among them in 1904 (Kouvalainen, 1995). These programs gained wider popularity after the Second World War. The Universal Declaration of Human Rights in 1948 was important in obligating the governments to arrange special health services for mothers and children. Promoting maternal and child health was also one of the core functions assigned to the World Health Organization established the same year. Since then, mothers and children started to be widely regarded as vulnerable groups in health plans and in need of special attention. Later, in 1978, the new primary health care approach served in drawing more attention to topics such as malnutrition and immunization that were also central in maternal and child health programs. (WHO, 2005)

In Finland, the first well-baby and antenatal clinics were founded in 1920's. As in other countries, more active developing of maternal and child health services started after the Second World War. In 1944, the municipalities were obligated by the law to offer these services and by 1960, the network of clinics was extensive. Finnish maternal and child health care has gained a good reputation abroad, especially so in the 1980's, partly due to lower perinatal and infant mortality compared to some central-European countries. (Kouvalainen, 1995) Since 1960's, men in Finland have been allowed to accompany their partners to child birth in hospitals (Vehvilainen-Julkunen & Liukkonen, 1998).

2.2.2. Components

Antenatal care

Antenatal care (ANC) is seen as an important opportunity for many health interventions and health education as well as for promoting the use of skilled attendance at birth (Wang, et al., 2011). Moreover, it connects the woman and her family with the health system (WHO, 2006b). Based on a systematic

review by Villar, et al. (2001), the WHO recommends at least four antenatal visits with skilled attendant for healthy women. According to its guidelines, the visits should include preventive measures such as tetanus toxoid immunization, identification and management of underlying conditions such as anemia, malaria, HIV and other sexually transmitted infections, and recognition of pregnancy-related complications. In addition, information about danger signs of complications should be given and breastfeeding and other healthy behaviors promoted. (WHO, 2006a)

Taking into account the general popularity of ANC, it is somewhat surprising that its effectiveness has been studied only limitedly (Burchett & Mayhew, 2009; Carroli, et al., 2001). The evidence speaks for ANC mainly in detecting chronic conditions but not so much in preventing the acute ones (Carroli, et al., 2001; De Brouwere, et al., 1998). For example Maine, et al. (1991) have argued that most of the conditions threatening woman's life at delivery can't be recognized in antenatal clinics. That kind of studies changed the way how antenatal care is considered: The former risk approach which emphasized the identification of pregnant women most prone to develop serious complications was abandoned, and wider health promotion approach was adopted. Thus, the focus of antenatal care is nowadays on improving maternal and child health and not primarily in reducing mortality, although educating women on signs of complications and many other interventions help to decrease mortality indirectly (Nuraini & Parker, 2005). (WHO & UNICEF, 2003)

Delivery care

The single most common cause for maternal deaths is severe bleeding which usually takes places after delivery, followed by infections (sepsis) also typically arising after childbirth (WHO, 1999). Thus, skilled attendant at birth; employing appropriate methods and recognizing different risk situations, and access to emergency obstetric care are considered as the most important factors in reducing maternal mortality (De Brouwere, et al., 1998; Graham, et al., 2001; WHO, et al., 2004). The WHO, the United Nations Population Fund (UNFPA) and the World Bank define skilled attendant as follows: "*A skilled attendant is an accredited health professional –such as a midwife, doctor or nurse- who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns*" (WHO, et al., 2004). As sepsis is often a result of

poor hygiene in delivery, ensuring hygienic conditions is crucial when working for safer pregnancy outcomes (WHO, 1999).

Postnatal care

Quality postnatal care has an essential part in maternal health care in recognizing and managing above mentioned complications as well as in improving neonatal survival (Wang, et al., 2011). Still, postnatal care is a neglected area in Africa and research on postnatal care in developing countries is scarce (Wang, et al., 2011; WHO, 2006b). Li, et al. (1996) found that more than 60 % of maternal deaths occur within six weeks after delivery and 80 % of postpartum deaths can be attributed to obstetric factors, which findings emphasize the importance of good delivery and postnatal care for the mother. What comes to the child, it has been estimated that if 90 % of the babies and their mothers received postnatal care, 10 to 27 % of newborn deaths could be avoided (WHO, 2006b). Moreover, as the WHO (2013b) informs, the majority of the babies born outside the health facilities do not receive any postnatal care which, for its part, suggests that delivering in an institute is beneficial in many ways.

2.3. Maternal health care utilization

2.3.1. Coverage of utilization

ANC utilization is nearly universal in most high- and middle-income countries today (WHO, 2005). Across most developing regions, the coverage has been on rise during the last two decades. Eighty percent of women had at least one antenatal visit in 2010 compared to 63 % in 1990. However, almost half of pregnant women in developing countries remained without the recommended care, minimum four visits, in 2010. Furthermore, in sub-Saharan Africa there has been a fall from 50 to 46 % between 1990 and 2010 (four visits or more). What comes to deliveries attended by skilled health personnel, the coverage is more than 95 % in most Northern American, European and Eastern Asian countries compared to 65 % in developing regions where the progress has been varying since 1990 (WHO, 2013c). No advance has taken place in the Caribbean and only little in sub-Saharan Africa, from 42 to 45 % in 2010. (UN, 2012)

In Ethiopia, maternal health care utilization is alarmingly low, even in relation to other low-income countries. According to the WHO's statistics, only 12 % of women had the recommended four antenatal visits in 2005 (*attention: by any, not necessarily skilled provider*) while the average for low-income countries was 36 %. Twenty-eight percent of Ethiopian women had at least one visit the same year and got attended by a skilled provider. Furthermore, in only 6 % of the deliveries there was a skilled attendant compared to 46 % for the countries in the same income group. (WHO, 2013c) The more recent figures of the EDHS 2011 show some improvement: the antenatal care coverage for four visits was 19 % (34 % for one visit from a skilled provider) and there was also a slight increase in proportion of deliveries attended by skilled personnel, to 10 % (CSA & ICF, 2012). The births attended by skilled personnel are usually those taking place in hospitals or other health institutions. Thus, the vast majority of Ethiopian women delivers at home with assistance of traditional birth attendants (28 %) or relatives (57 %), or alone (4 %) (CSA & ICF, 2012).

2.3.2. Socio-demographic factors connected to utilization

Previous research in developing countries has suggested several reasons for low utilization of maternal health care which include: problems in access, low educational level and other factors describing socio-demographic background (mostly studied from the female perspective), lack of woman's autonomy, low quality of services, cultural beliefs and other community members' influence (Lubbock & Stephenson, 2008; Simkhada, et al., 2008; Tlebere, et al., 2007). In Ethiopia, the women not delivering in an institution explain their action by stating that it is not necessary (61 %), it is not customary (30 %) and/or that the distance is too long or they had no transportation (14 %) (CSA & ICF, 2012).

Socio-demographic factors such as *education* and *wealth* are known to affect many health behaviors and outcomes, and various studies on women have found positive associations between these factors and maternal health care utilization (Addai, 2006; Anwar, et al., 2006; Babalola & Fatusi, 2009; Mahabub-UI-Osubor, et al., 2006; Sein, 2012; Simkhada, et al., 2008). Simkhada, et al. (2008) have carried out a systematic review about antenatal care (ANC) utilization in developing countries which revealed that woman's education was the strongest predictor of ANC visits in sixteen studies out of twenty-eight. Women with better education seemed to be more likely to both receive the recommended number of visits and start the visits earlier than less educated women. What comes to the economic status, its role in advancing health care use is not straightforward; it is proposed that other factors such

as education act as mediators, in other words, better off people tend to be also better educated (Addai, 2000; Leslie & Gupta, 1989). In Simkhada's review, better socio-economic status or standard of living was detected as a positive contributor for service utilization in nearly half (twelve) of the studies.

Furthermore, urban *residence* and lower number of children (lower *parity*) usually contribute to higher service use (Simkhada, et al., 2008; Stewart & Sommerfelt, 1991). The results are more varying when other socio-demographic factors; *age*, *occupation*, *marital status*, *religion* and *ethnicity* are examined. According to Simkhada's and colleagues' review, when there was some evidence about significant relationship, it spoke for the following: Women in their thirties are more likely to use ANC than teenagers and older women, employment outside home contributes to better utilization of ANC, married women receive ANC more often than the single ones and belonging to certain ethnic groups or confessions also matters when the levels of ANC use are assessed.

Socio-demographic factors and antenatal care utilization in Ethiopia

There is some research on the relationship of maternal health care utilization and socio-demographic factors in Ethiopian context, most of it conducted during the last few years. ANC seeking has been focused the most. Regassa (2011) found that formal employment, lower parity (maximum of three children), younger age, and being literate were predictors for ANC use among women residing in Sidama zone, southern Ethiopia. Employment as a civil servant was the strongest predictor. The representative sample comprised of 1 094 households.

Another study conducted in Hadiya zone, located also in southern part of Ethiopia, revealed significant associations between the utilization of ANC and lower number of children, having at least primary education compared to inability to read and write and, contrary to usual findings, higher age. Lower parity turned out to be a very strong determinant: Women with less than three children were eight times more likely to utilize ANC than those having more than five children. A total of 691 women were interviewed for the study; this sample was stated to be "fairly representative". (Abosse, 2010)

Mekonnen and Asnaketch (2002) used nationally representative EDHS data, having a sample of 7978 Ethiopian women, and brought evidence about place of residence, women's education, marital status and religion being connected to ANC utilization. Out of these, urban residence and women's secondary or higher education turned out to be the strongest predictors; the odds for both being four-fold compared to their opposite alternatives. Being married was associated with better antenatal service

utilization than being single. Muslim women were the most likely and traditional faith practitioners the least likely to receive ANC services, which, for Muslims' part, is somewhat contradictory to findings in other studies.

Socio-demographic factors and delivery care utilization in Ethiopia

Delivery care utilization in Ethiopia has been investigated in a few studies. In a study of Amano, et al. (2012) from Arsi zone in South-East Ethiopia urban residence, secondary or higher education both of the woman and the husband, first pregnancy and young age were among the factors contributing to an institutional delivery. In this study mothers less than 20 years of age were six times more likely to deliver at health institutions than mothers aged 35 and above. What comes to the difference between the urban and rural areas, it was two-fold for urban women. The odds for delivering in an institute was four times higher for women having at least secondary education than for women unable to read and write. Also husbands' educational level seemed to be a relatively strong predictor for delivery care utilization; the difference between the highest and lowest education groups was three-fold. There were 855 women in the representative sample.

Mulumebet, et al. (2011) have also studied institutional deliveries in Arsi zone, and they discovered that urban residence, maternal education, low parity and religion were associated with the use of safe delivery services. Orthodox Christians and Muslims were less likely to utilize the service than other Christians. Urban residence turned out to be a strong predictor also in this study; urban women were eight times more likely to deliver in an institute than rural women. Education was the second most important predictor; among highly educated the odds for service utilization were five-fold compared to illiterate participants. The representative sample consisted of 1074 women.

Lastly, Mekonnen and Asnaketch (2002), in their study using the nationally representative EDHS data, found three predictors for delivery service utilization: urban residence, high educational status and low parity. It is striking that the women living in the capital, Addis Ababa, were 40 times more likely to have a skilled attendant at birth compared to the rural women. In urban areas generally the difference to the rural situation was also marked but not as dramatic; it was nine-fold. Women with secondary or higher education had eight-fold odds for delivering in an institute compared to women without schooling. Having only one child contributed to two-fold likelihood of service utilization compared to higher parity.

When the results of the above mentioned studies are drawn together, women's education or literacy status is the socio-demographic factor most often connected to maternal health care utilization in Ethiopia; one of them was detected as a predictor in all of the studies. According to this small-scale review, low parity seems to be the second most common and urban residence the third most common predictor. It is interesting that wealth did not turn out to be an independent explanator in any of the studies.

2.3.3. Access to services

Difficulties in access, which here refers to geographic access, have been shown to be an important barrier to health care utilization (Simkhada, et al., 2008; Hjortsberg, 2003). This obstacle is, obviously, more common in low-income countries and especially in rural areas, where health facility and road network is sparse, roads can be in poor condition and transportation services are lacking. Moreover, travelling long distances creates additional obstacles, particularly for poor people, in form of costs and time lost from household and other working activities (Peters, et al., 2008). According to the World Bank (2009), in sub-Saharan Africa more than 60 % of the population lives in rural areas. An example of a country where long distances are reality for most of the poor people is Chad where 80 % of the poorest fifth live more than one hour from a health facility (World Bank, 2004).

Going back to previously mentioned Simkhada's and colleagues' report (2008), accessing factors explained ANC utilization in developing countries in ten studies out of the total twenty-eight. Place of residence (which can be alternatively classified as a socio-demographic variable) was the most prominent of these factors, followed by distance and transportation. In a study carried out in Zambia, factors such as distance and owning a vehicle were detected to influence health care seeking (Hjortsberg, 2003). In qualitative studies from Nicaragua, Pakistan and Zimbabwe, the women mentioned several problems in access: uncomfortable transport, poor road conditions, dangerous journey, difficulties in crossing big rivers and lack of money for paying the trip (Lubbock & Stephenson, 2008; Mathole, et al., 2004; Mumtaz & Salway, 2005).

As stated above, in Ethiopia the place of residence seems to influence fairly strongly maternal health care utilization. The restricted use of services associated with rural residing can be considered a serious problem in a country where the great majority of the population, 84 %, lives in the countryside (CSA &

ICF, 2012). According to the WHO (2002), long distances are reality for most of the rural-dwellers in Ethiopia; fewer than half of them living within a walking distance of a health care facility. Taking transport to a facility, lack of money and distance to a health facility were the three most important factors that Ethiopian women mentioned when asked about barriers to health care utilization (CSA & ICF, 2012). Accordingly, Mekonnen and Asnaketch (2002) propose, based on a former, unpublished study conducted in southern Ethiopia, that socio-demographic factors would be important mainly in urban context whereas in rural areas accessing factors would be more central in explaining maternal health care utilization.

2.4. Household decision-making

Ethiopia is a patriarchal society where women's position continues to be weak. In such societies girls are typically treated inferior to boys during the socialization process which determines gender roles. While boys are expected to become self-reliant, girls are brought up to obey and conform. (Haregewoin & Emebet, 2003; Hirut, 2004) In addition to other areas of life, woman's inferior status can be seen in decision-making processes within the family which the husband (or partner) typically dominates. In EDHS 2011 it was found out that the man has a more powerful say also regarding to his partner's health care use: The man decides about woman's health care in 25 % of the households whereas the woman decides independently about this issue just in 13 % of the households. In the remaining cases the decision is made together. (CSA & ICF, 2012)

2.4.1. Women's empowerment

The strong influence of the male partner on woman's health care utilization seems to indicate two solutions when aiming to increase the service use: One, women's decision-making autonomy should be enhanced and two, men should be used as agents to promote their spouses health care seeking. Empowering women to take the action into their own hands has been a popular developmental ideology during the last decades. It came into discussion in the 1970's and by the end of the 1980's it had become a central component of health promotion, especially sexual health promotion strategies (Mosedale, 2005; Stein, 1997).

There are several reasons behind the popularity of the empowerment approach. Trying to guarantee women the same opportunities that men enjoy and achieving gender equality is considered valuable by itself (UNFPA, n.d.). In addition, in the developmental discourse in the 80's men were generally identified as uncaring and unconcerned in their relationship with women and thus, working directly with women, to even protect them from the male impact, seemed to provide a key (Sternberg & Hubley 2004; Stycos, 1996). Moreover, from the developmental perspective this approach is appealing because female empowerment has been connected with economic growth as well as with many areas of human development (Doepke & Tertilt, 2011). There is evidence about women's higher autonomy being positively associated with their and their children's health (Castle, 1993; Gupta, 1990) whereas negative outcomes, such as restricted use of maternal health services, have been attributed to low levels of autonomy, which result has been obtained in Ethiopian context, too (Matthews, et al., 2006; Woldemicael & Tenkorang, 2010).

However, changing the social- and culture -bound power relationships between male and female has appeared as a slow process, which was mentioned for example in the Human Development Report 1999 of the United Nations Development Program (UNDP). Furthermore, as Sternberg and Hubley (2004) write in their study, empowering women without paying attention to men *"...is at best a partial solution and at worst could create more conflict and result in more problems by increasing men's feelings of alienation"*. These weaknesses of the empowerment strategy were among the factors that led towards a new way of thinking about men's participation in health promotion (Sternberg & Hubley, 2004).

2.5. Male involvement in reproductive health

The other above proposed method, using men as promoters for their partners' health care utilization, has gained popularity since the 1990's. Although the husband wouldn't directly advice the spouse not to seek maternal health care services, lack of support might have same outcome. That was revealed in a study from South Africa by Tlebere, et al. (2007) in which they concluded that among many factors, support of family and friends was the strongest promoter of maternal health care use.

The importance of men to women's reproductive health and more generally, in sexual and reproductive health promotion, was officially recognized at the 1994 International Conference on Population and Development in Cairo, and the topic was further elaborated at the Fourth Women's International Conference in Beijing the following year (Sternberg & Hubley, 2004; UNFPA, 1995b). By the turn of the millennium, male involvement –as the approach is commonly called- had begun to get more attention among professionals and program planners in the field (Population Council, 2000). In 1997, the United Nations Population Fund (UNFPA) published a booklet that proposed a new role for men: Instead of being the “threat” that the empowerment programs have to combat, men should be seen as central players in improving women's status. Thus, according to this view, integrating men doesn't mean deteriorating women's situation but vice versa, though more pessimistic views about enhancing men's position further over women have been expressed, too (Sternberg & Hubley, 2004; UNFPA, 1995a).

There is no single definition for male involvement. The UNFPA explains male involvement as an umbrella term which comprises of the several aspects of men and reproduction: reproductive health problems and programs, reproductive rights and reproductive behavior. Furthermore, the UNFPA gives male involvement two dimensions: One, men as supportive partners in women's reproductive health needs, choices and rights and two, men's own reproductive and sexual behavior. Accordingly, male involvement can mean different strategies from education and awareness raising to actual participation. Involving men in reproductive health programs is considered beneficial in many ways, and this perspective has been justified for example through men's various roles as sexual partners, husbands, fathers, family and household members, community leaders and many times as gatekeepers to health information and services. (UNFPA, 1995a)

2.5.1. Male involvement in maternal health care and its determinants

Despite of the increasing efforts to target men, the research over men's influence on maternal health outcomes and maternal health care utilization in developing countries is still scarce. Regarding the determinants of male involvement in maternal health services, one review focusing the prevention of mother to child transmission of HIV (PMTCT), by Ditekemena, et al. (2012), was traced. However, only a provisional article was available by the time of writing this review and thus, some information may be incomplete. Thirty-four studies were included in the review that covered sub-Saharan Africa.

Although the number of studies was quite high, most of them gave a relatively narrow definition for male involvement as participation during antenatal HIV testing or in HIV couple counseling. Three main categories of determinants were identified: socio-demographic factors, health service related factors and sociologic factors.

In Ditekemena's (2012) review, socio-demographic factors were associated with male participation in PMTCT services as follows: *Age, marital status, education and profession* were the factors that appeared to contribute to participation. Interestingly, place of residence wasn't among the determinants (still taking into account the provisional nature of the paper). Older age and cohabiting seemed to be the most common predictors. It is also surprising that higher education was found to explain the involvement just in one of the studies; in Uganda the men who had completed at least eight years of education were twice more likely to participate than those who had studied less than that (Byamugisha, et al., 2010). What comes to profession, for example men in occasional and low-paid jobs were less likely to accompany their spouses to the health services than their counterparts (Kowalczyk, et al., 2002; Reece, et al., 2010).

Studies from India and Uganda support the view that men's knowledge about pregnancy-related care increases its utilization, and the Indian study further proposes that men's presence during antenatal visits might increase the likelihood of institutional delivery (Chattopadhyay, 2012; Tweheyo, et al., 2010).

Two Ethiopian studies included husband's attitude among the study variables when exploring maternal health care utilization. Abosse, et al. (2010) and Mulumebet, et al. (2011) found that husbands' attitude was associated with antenatal and safe delivery service utilization in Ethiopia, positive attitude contributing to more frequent utilization. In Abosse's study, the effect of positive attitude was three-fold compared to negative attitude.

A study from Nigeria concluded that husband's educational and occupational levels are connected to the decision about delivery place, higher levels being contributing to institutional delivery. 1500 randomly selected women who had delivered within three months preceding the survey formed the sample. (Onah, et al., 2006). As mentioned previously, Amano, et al. (2012) obtained a similar result concerning husband's education in Ethiopia.

How does men's socio-demographic background relate to maternal health care utilization in Ethiopia and which are these factors? To date, no studies have apparently been conducted straight on this topic in Ethiopian context. More knowledge about male influence is needed to have a wider selection of instruments for promoting safe pregnancy and motherhood in Ethiopia.

3. Objectives

The aim of this study is to explore maternal health care utilization in Ethiopia from male partners' perspective. More specifically, the purpose is to find out how much maternal health service utilization varies according to husbands' (or partners') socio-demographic characteristics.

The specific objectives are:

- To study how male partners' socio-demographic background is reflected in women's maternal health care seeking behavior, measured by antenatal service use and choice of institutional delivery.
- To study how male partners' socio-demographic background is reflected in their own participation in antenatal check-ups.
- To determine the possible differences between urban and rural areas in socio-demographic characteristics associated with choice of delivery place.

4. Materials and methods

4.1. Study area

Ethiopia is located in the Horn of Africa (figure 1) and it is regarded as one of the cradles of mankind. Contrary to most of the African countries, it remained independent also during the colonial era. (CSA & ICF, 2012) Today, Ethiopia is one of the poorest countries in the world and its human development is also very low, ranking 174th among 187 countries (UNDP, 2011). Life-expectancy at birth was 54 years in 2009 (WHO, 2013c). However, Ethiopian economy has grown significantly during the last few years and investments have been made in sectors such as education and health which are important in fighting poverty (Ministry for Foreign Affairs of Finland, 2012). Despite of the increasing financing of the health sector, health expenditure per capita is still only 17 USD compared to 4325 USD in Finland (World Bank, 2013). Agriculture is the main source of income for Ethiopia, accounting for 43 % of the gross domestic product (CSA & ICF, 2012).



Figure 1. Map of Ethiopia (Source: Central Intelligence Agency <https://www.cia.gov/library/publications/the-world-factbook/geos/et.html>)

The population of Ethiopia is 86,5 million and it is still increasing, but the growth rate has been on decline since 1984, being now 2,1 % (UNFPA, 2012). The total fertility rate is 4,2 children per woman

(WHO, 2013c). The vast majority of Ethiopians live in rural areas and only 16 % in the cities, which makes it one of the least urbanized countries in the world. Ethiopia is culturally rich, partly due to its situation close to Middle East and the border of two continents. There are more than 80 ethnic groups in the country. Orthodox Christianity and Islam are the main religions, about half and one-third of the population belonging to these confessions, respectively. (CSA & ICF, 2012)

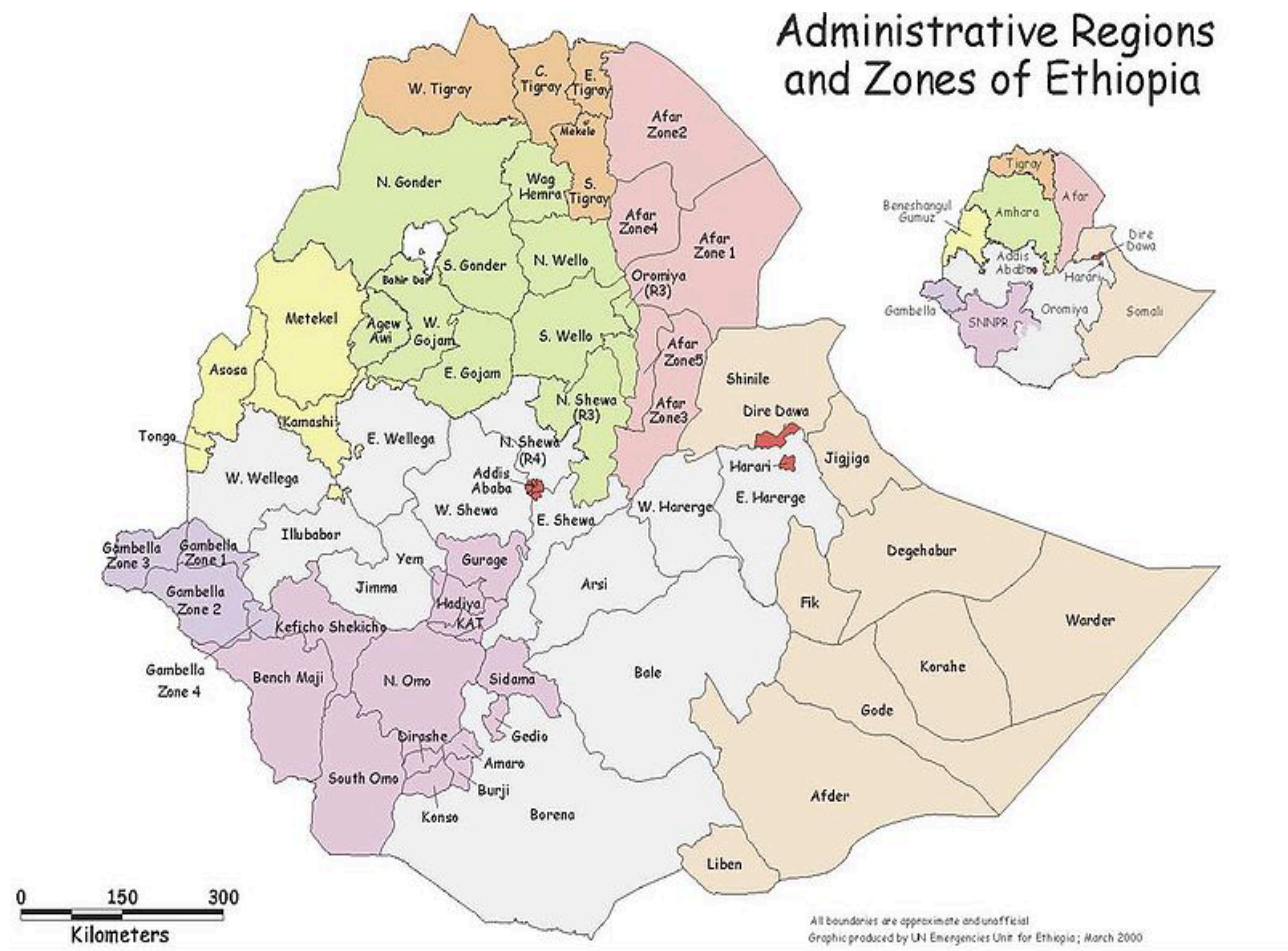


Figure 2. Administrative regions and zones of Ethiopia (Source: USAID <http://www.usaidethiopia.org>)

4.1.1. Health care system in Ethiopia

Most of Ethiopia's health problems are attributed to communicable diseases. The Federal Ministry of Health, Regional Health Bureaus and Woreda Health Offices share the responsibility of health policy and service delivery. The health system is under reform for problems in performance, and the current four-tier system will be reorganized into a three-tier structure with specialized hospitals, general hospitals and primary health care units. Special attention is being paid to improve the primary health

care coverage of the rural population, e.g. the structure of primary health care will be different in rural areas. Expanding physical health infrastructure is a key component of the Health Extension Program (HEP), a part of the Health Sector Development Program implemented since 1996 (CSA & ICF, 2012). (FMOH, 2010)

Ethiopia is lacking human resources in health services. In 2008, the physician-to-population ratio was 1:37 996, which is far below the WHO recommendation of 1:10 000. Also health officers- and nurses-to-population ratios are very low. In recent years, Ethiopia has put effort on the training of health extension workers (another important component of HEP) who provide basic preventive and curative services in the rural communities (CSA & ICF, 2012). In addition, health officers are trained in emergency obstetric care. (FMOH, 2010)

4.2. Data source

Secondary data from Ethiopia Demographic and Health Survey (EDHS) 2011 will be used for this study. The survey is part of the MEASURE DHS project, funded by United States Agency for International Development (USAID), which aims to collect good quality health data from developing countries. The DHS:s focus on sexual and reproductive health topics such as fertility, family planning, maternal and child health, gender and HIV/AIDS but usually also cover other central issues such as malaria and nutrition. The basic data collection unit is household but female and in recent years often male sub-surveys are conducted in addition. Sample sizes are large, from 5 000 to 30 000 households, and the surveys are representative at the national level. Furthermore, all the participants are interviewed using a structured questionnaire. (MEASURE DHS, 2013)

In Ethiopia, the 2011 survey is the third of a kind; the previous ones were carried out in 2000 and 2005. The data collection took place between December 2010 and June 2011. All the three questionnaires, household, woman's and man's, were used, and they were adapted from the standard models to mirror the situation in Ethiopia. (MEASURE DHS, 2013) Register for dataset access. All DHS datasets are free to download and use. To download datasets, you must complete a short registration form.

To get access to the data, an online registration form was completed. Once the request was approved, the datasets could be downloaded using personal username and password.

4.3. Study population, sampling and sample size

The male participants in the EDHS 2011, who have 0-2 year-old children, form the study population. The method of sampling was as follows: The sampling frame was the Population and Housing Census conducted in 2007. For administrative purposes, Ethiopia's 11 geographic regions are divided into zones (figure 2), which are further divided into units called *weredas*. Under the *weredas* are the lowest administrative units called *kebeles*. For the census, each *kebele* was subdivided into Enumeration Areas (EA) with appropriate number of housing units. This structure can be seen in figure 3. (CSA & ICF, 2012)

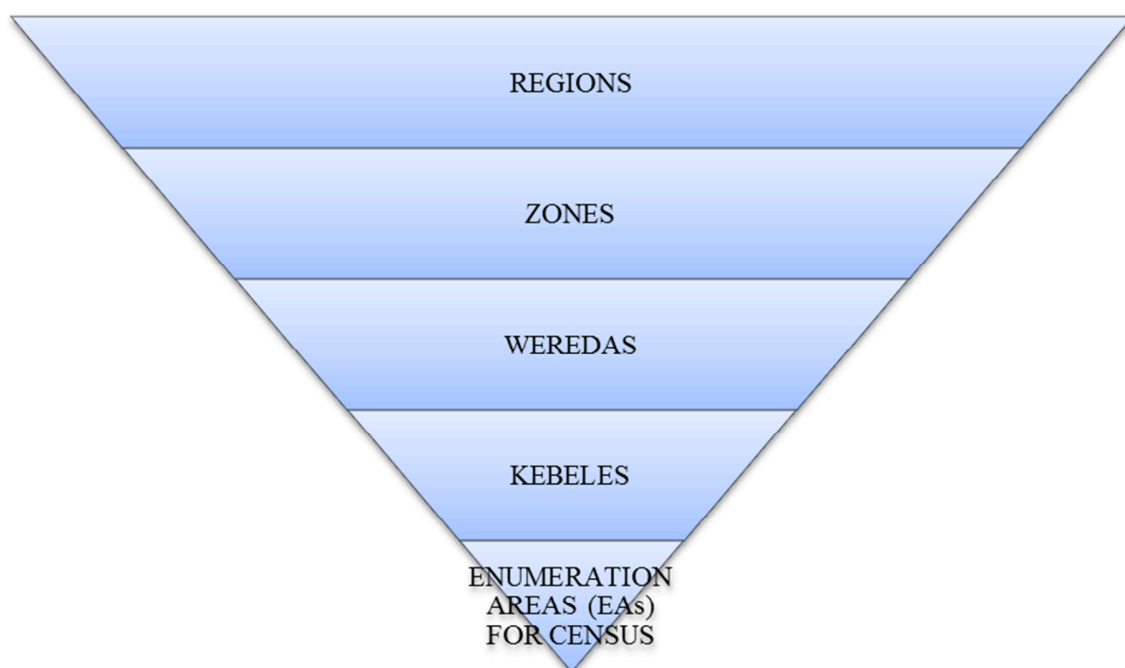


Figure 3. Hierarchy of administrative units of Ethiopia and EAs

The 2011 EDHS sample was drawn using a stratified, two-stage cluster design. The stratas were obtained by separating each region into urban and rural areas. The EAs served as the first stage sampling units and the households the second stage. 624 of the total 85 057 EAs were selected for the sample, 187 in urban and 437 in rural areas. All the conventional households, excluding institutions,

were listed in those areas and a representative sample was selected, comprising of 17 817 households. In the Somali region, some modifications were made to sampling procedure due to security and climatic reasons and therefore, the data of that region might be partially unrepresentative. Still, this doesn't affect national-level estimates as the proportion of the population not covered is very small. (CSA & ICF, 2012)

Figure 4 illustrates how the study sample was formed, starting from the household level. 16 702 out of the 17 817 selected households could be interviewed (17 018 of the households were found to be inhabited at the time of data collection). All the 15-59 year-old men who were usual residents or who slept in the selected households the night before the survey were eligible for the male survey. A total of 15 908 men were identified for interview and 14 110 interviews could be completed, giving a response rate of 89 %. The final inclusion criterion for this study was to have a 0-2 year-old child as the questions concerning spouse's maternal health care utilization were asked from men whose youngest child was of that age. Consequently, the sample size of this study turned out to be 4 206 men. (CSA & ICF, 2012)

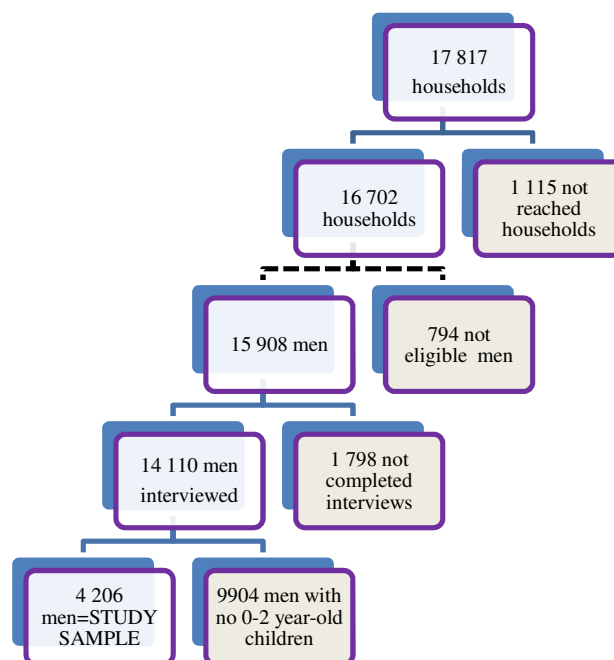


Figure 4. Study sample formation

4.4. Variables

The data was already in the SPSS (Statistical Package for the Social Sciences) format. Some alterations were made to the variable categories, and quantitative variables were transformed into qualitative ones in order to facilitate the comparisons.

4.4.1. Response variables

Maternal health care utilization was described with three variables in this study: 1) *antenatal check-ups for the mother of most recent child*, 2) *respondent present during check-ups for most recent child*, and 3) *place of birth of most recent child*. First of these variables had originally three categories (no/ yes/ don't know) but to simplify the logistic regression analysis, the observations in the "don't know"-category were marked as missing. This modification doesn't affect the results as only 1,1 % of the observations belonged to that group. The other two response variables were dichotomous (not present/ present were the alternatives for the second, and hospital or health facility/ other for the third variable). In the report, I will use the terms institutional and health facility delivery interchangeably, the both including also hospital delivery. "Most recent child" refers to respondent's child whose age was 0-2 years at the time of the interview.

4.4.2. Explanatory variables

The explanatory variables, describing male partner's socio-demographic background were *age*, *marital status*, *number of children* (total number of children ever born), *educational level*, *occupation*, *wealth* (in the form of wealth index), *religion*, *ethnicity*, *type of place of residence* and *vehicle in the household*. Men in active reproductive age, from 15 to 59 years, had been included in the EDHS. Ten-year categories were formed starting from 15 years, with the exception of the last group, comprising of men over 44 years of age. Marital status categories were combined into three groups: married, living with partner and not married/in union, the last entity including divorced, separated, widowed and single men. In the report, I will use the terms partner and spouse also when referring to the legal partner (wife). Number of children was categorized (1-2/ 3-5/ 6-10/ 11 or more).

According to the completed education, the study objects had been divided into following groups in the original data set: men with no education, those with primary, secondary and higher level of education. The same categories were retained for this study, as were the categories defining respondents'

occupation and wealth. There were eight categories for occupation (not working/ professional, technical, managerial/ clerical/ sales/ agriculture-employee/ services/ skilled manual/ unskilled manual). Wealth was described using a wealth index which is calculated so that all the studied individuals are placed on the scale according to their wealth (more precisely, the wealth of the household they live in) and divided into five groups which have an equal number of individuals in each (quintiles). The advantage of the wealth index is that it facilitates the identification of problems connected to poverty and is, thus, especially useful in health research in developing country context (MEASURE DHS, 2013).

Under the variable “religion” there were the categories of the main confessions’ representatives in Ethiopia: Orthodox, Muslim, Protestant, Catholic and traditional religions’ believers. The category “other” in the original data set, standing for smaller but unnamed religious groups, was excluded (and marked as missing in the data) to facilitate the interpretation of the results. Only 1,8 % of the study population belonged to that group. Moreover, for practical reasons the number of ethnical groups had to be limited and we decided to include ten biggest groups out of 43, covering 85 % of the study population, in the analysis. The other groups were marked as missing in the data. The size order of the groups was checked from the 2007 census.

Type of place of residence was categorized into rural and urban. The last variable, vehicle in the household, was attached from the household data set. Originally, there were four separate variables for different types of vehicles: bicycle, motorcycle, car or truck and animal-drawn cart but these were combined into one variable having two categories (no/ yes). In addition to tell about respondent’s socio-demographic status, these two last variables describe the access to health services.

4.5. Statistical analyses

All the statistical analyses were conducted using SPSS statistical software, version 20. Sample weights were used in descriptive analyses in order to adjust for the sample design; this ensures that the results are representative at the national and regional levels. The limit of statistical significance was set at 5 % ($p < 0,05$).

First, the data was described using frequency distributions and graphical methods (bar charts). After that the associations between the maternal health care utilization variables and the socio-demographic variables describing men's background were explored with cross-tabulations, and the statistical significance of the differences was tested using Pearson's chi-square (χ^2) test or in some cases (if the assumptions were not met for the χ^2 test) Fisher's exact test.

To find out the strengths of the associations, binary logistic regression analyses were conducted. Each of the response variables was coded so that the outcome of interest got value 1 and the other category was coded 0. The first step was to reveal the strength of the association between each pair of the variables, explanatory and response, separately. The results of this univariate analysis are expressed as crude Odds Ratios (OR) with 95 % confidence intervals (CI). Next, the explanatory variables that turned out to be statistically significant in the univariate analysis, were entered at the same time in a multivariate logistic regression analysis to control for the possible confounding effect. If the resulting adjusted ORs differed markedly from the crude ORs, it could be stated that confounding was present.

Based on the assumption of Mekonnen & Asnaketch (2002) about the different importance of the socio-demographic factors in urban and rural contexts, and the results of the logistic regression that indicated relatively big differences in the use of delivery care in these two settings, we decided to examine the issue further. Thus, two additional analyses were conducted. First of them, stratified analysis, stratified by *type of place of residence*, helped to find out which factors predicted institutional delivery in the cities and which in the countryside. Same steps were followed as in the analysis of whole data but the reference categories were changed for a few variables (marital status, number of children, occupation and wealth); otherwise none of the comparisons appeared significant even though the variable was significant as a whole. Finally, with an interaction analysis we wanted to see whether the influence of the background factors really differed in urban and rural contexts. To this end, an interaction term (consisting of *type of place of residence* and one of the other explanatory variables at a time) with other independent variables was entered into the model predicting institutional delivery.

5. Results

5.1. Description of the study population

The weighted number of study objects was 4269.

The characteristics of the study population are presented in table 1. Most of the studied men were 25-44 years of age. The proportion of young fathers, less than 25 years, was only 7 %. Nearly all (96 %) were married. The number of offspring varied from 1 to 29 but most commonly men had 3-5 children.

The vast majority of the study objects, 92 %, didn't have any formal education or just primary education. Working as an employee in the agricultural sector was the most common occupation (81 %). Next biggest groups were sales and skilled manual workers, 7 % and 6 % respectively. What comes to the wealth of the study population, the number of individuals was lowest in the "richest" group and the second lowest in the adjacent group.

The study participants belonged to the following confessions: Most of the studied men were Orthodox (40 %), followed by Muslims (36 %) and Protestants (21 %). There were only a small number of traditional and Catholic religions' representatives.

The spectrum of ethnical backgrounds was wide though the majority belonged to either Oromos (39 %) or Amharas (25 %). Altogether, the participants represented 43 different ethnical groups. 87 % lived in rural areas. In only 3 % of the households of the participants there was a vehicle.

Table 1. Description of the study population, 15-59 year-old Ethiopian men with 0-2 year-old child in 2010/11 (weighted numbers)

Socio-demographic characteristic	Frequency (total 4269)	Percent
<i>Age</i>		
15-24	304	7,1
25-34	1817	42,6
35-44	1492	35,0
45-59	655	15,3

<i>Marital status</i>		
Married	4081	95,6
In union	127	3,0
Not married/in union	61	1,4
<i>Number of children</i>		
1-2	1269	29,7
3-5	1601	37,5
6-10	1157	27,1
11 or more	242	5,7
<i>Educational level</i>		
No education	1971	46,2
Primary	1951	45,7
Secondary	189	4,4
Higher	157	3,7
<i>Occupation</i>		
Not working	29	0,7
Professional/technical/managerial	128	3,0
Clerical	28	0,7
Sales	300	7,0
Agriculture-employee	3438	80,5
Services	28	0,7
Skilled manual	238	5,6
Unskilled manual	34	0,8
<i>Not known</i>	45	1,1
<i>Wealth index</i>		
Poorest	935	21,9
Poorer	966	22,6
Middle	925	21,7
Richer	815	19,1
Richest	628	14,7
<i>Religion</i>		
Orthodox	1703	39,9
Catholic	25	0,6
Protestant	889	20,8
Muslim	1519	35,6
Traditional	53	1,2
<i>Other groups and not known</i>	80	1,9
<i>Ethnicity (10 biggest groups)</i>		
Affar	28	0,7
Amhara	1070	25,1
Gamo	73	1,7
Guragie	76	1,8
Hadiya	55	1,3
Oromo	1684	39,4
Sidama	178	4,2
Somalie	110	2,6

Tigrie	254	6,0
Welaita	115	2,7
<i>Other groups and not known</i>	626	14,7
<i>Type of place of residence</i>		
Urban	542	12,7
Rural	3726	87,3
<i>Vehicle in the household</i>		
No	4120	96,5
Yes	145	3,4
<i>Not known</i>	4	0,1

5.2. Cross-tabulations

5.2.1 Antenatal care for women

57 % of the spouses of the study participants had at least one antenatal visit. All the men's background characteristics under examination were significantly associated with women's ANC use and the results can be seen in table 2. ANC utilization was somewhat higher among spouses of 25-44 old men than in the youngest and oldest age groups. What comes to the marital status, the partners of men not in union were the least likely to use services. Furthermore, having more children seemed to contribute to lower ANC utilization among women. Still, the differences between the categories of these variables were not very wide, being at widest 13 percentage units.

Men's educational level, type of occupation and wealth were factors that were closely associated with spouses' health care seeking behavior. More than 90 % of the spouses of men with higher education or in clerical or service work had at least one antenatal visit whereas spouses of men with no education or without formal employment were utilizing the services markedly less (46 % and 31 %, respectively). The higher the wealth, the higher the probability to ANC utilization.

Orthodox men's partners were the most likely (61 %) and the partners of traditional religions' representatives the least likely (43 %) to seek maternal health care. There were wider differences between the ethnical groups: Among Guragie men's spouses ANC utilization was more than three-fold compared to Somalie men's spouses (88 % and 26 %). Living in urban areas was associated with more frequent service utilization than living in the countryside. Also having a vehicle in the household was related to more active health care seeking behavior.

5.2.2. Male partners' participation in antenatal care

43 % of the respondents accompanied their spouses to antenatal check-ups. Owning a vehicle was not significantly associated with men's participation in ANC; it was the only insignificant variable when examining the associations to maternal health care utilization. Younger men and men not in union were more likely to accompany their spouses than older men and men in stable relationships (table 2). Number of children was negatively associated with men's participation.

Educational level, occupation and wealth gave similar results as with women's ANC but the variation between the categories was lower. As an example, 39 % of men without formal education and 64 % of men with higher than secondary education followed their partners to check-ups.

Again, belonging to the Orthodox church was behind the highest and practicing traditional religions behind the lowest utilization. However, the picture was somewhat different regarding the ethnical background; this time the Affars (80 %) and the Hadiyas (28 %) were in the opposite ends of the spectrum. The difference between urban and rural dwellers wasn't very wide (55 % versus 40 %).

5.2.3. Institutional delivery

Only 12 % of the partners of the studied men delivered in a hospital or health facility. All the background characteristics were significantly associated with place of birth of most recent child; the results can be seen in table 2. Of the three studied maternal health care components, this was the one that varied most between the study objects.

Institutional delivery was most common among partners of 25-34 year-old men. Looking at the marital status, married men's spouses were the least likely to have given birth in health facilities (11 % in contrast with 18 % for other groups.) As previously, higher number of children was associated with lower service utilization.

There is a marked difference in institutional delivery figures when compared men with primary (11 %) and secondary education (41 %). In the highest education group more than a half of the partners (54 %) had given birth in an institute. What is remarkable regarding the type of occupation is that the ones to

utilize the services least were the spouses of agricultural-employees (5 %) and not those of unemployed men.

Wealth was the factor that divided the study population most: the difference between partners of men in “poorest” and “richest” wealth quintiles was even 21-fold. A very wide gap could be found between the spouses of men in the two highest categories, from 9 % to 49 %.

None of the partners of traditional religion believers delivered in an institute. Predictably, Orthodox men’s spouses utilized the delivery services more than other religions’ representatives. As with women’s maternal health care utilization, the partners of Guragie men were the most active to seek care, nearly half of them giving birth in a health facility. That was over two times more than with the next group, Tigries (20 %). Only 3 % of Sidama men’s partners had an institutional delivery.

Over half of the spouses of urban men in comparison with only 5 % of the rural counterparts delivered in an institute. Having a vehicle in the household was associated with institutional delivery two times more often than not having one.

Table 2. Maternal health care utilization by male partners’ background characteristics in Ethiopia 2008-2011, min. and max. figures in bold

Socio-demographic characteristic	ANC for women % (56,6)	ANC / man present % (43,0)	Institutional delivery % (11,6)
Age	<i>p=0,002</i>	<i>p=0,015</i>	<i>p<0,001</i>
15-24	52,3	49,0	9,5
25-34	58,7	45,3	14,6
35-44	57,5	41,1	9,3
45-59	50,9	37,2	9,7
Marital status	<i>p=0,027</i>	<i>p=0,048</i>	<i>p=0,019</i>
Married	57,1	43,3	11,3
In union	48,8	27,9	18,1
Not married/in union	44,3	48,1	18,0
Number of children	<i>p=0,001</i>	<i>p<0,001</i>	<i>p<0,001</i>
1-2	60,6	50,7	18,9
3-5	56,9	40,5	11,0
6-10	53,3	38,9	6,3
11 or more	50,2	32,8	2,9
Educational level	<i>p<0,001</i>	<i>p<0,001</i>	<i>p<0,001</i>
No education	46,3	39,0	6,5
Primary	61,6	41,4	10,6
Secondary	85,2	57,8	41,3
Higher	90,4	64,1	53,5

Occupation	<i>p</i> <0,001	<i>p</i> <0,001	<i>p</i> <0,001
Not working	31,0	37,5	24,1
Professional/technical/managerial	87,4	58,6	44,5
Clerical	93,1	66,7	71,4
Sales	74,7	47,2	37,7
Agriculture-employee	51,9	39,3	4,8
Services	92,6	52,0	57,1
Skilled manual	75,5	57,9	42,1
Unskilled manual	83,3	44,0	38,7
Wealth index	<i>p</i> <0,001	<i>p</i> <0,001	<i>p</i> <0,001
Poorest	37,5	35,7	2,4
Poorer	48,8	40,0	4,8
Middle	53,9	39,2	4,7
Richer	70,2	43,1	9,0
Richest	84,0	53,9	49,3
Religion	<i>p</i> <0,001	<i>p</i> <0,001	<i>p</i> <0,001
Orthodox	61,2	49,8	16,8
Catholic	60,0	33,3	8,0
Protestant	55,9	43,7	7,5
Muslim	52,4	34,9	8,6
Traditional	42,6	21,7	0,0
Ethnicity (10 biggest groups)	<i>p</i> <0,001	<i>p</i> <0,001	<i>p</i> <0,001
Affar	35,7	80,0	7,1
Amhara	53,8	53,1	15,6
Gamo	63,9	40,4	6,9
Guragie	88,0	39,4	44,7
Hadiya	66,7	27,8	5,5
Oromo	58,2	40,2	9,8
Sidama	49,4	29,1	3,4
Somalie	25,9	53,6	8,2
Tigrie	83,6	39,2	20,2
Welaita	49,6	33,9	7,1
Type of place of residence	<i>p</i> <0,001	<i>p</i> <0,001	<i>p</i> <0,001
Urban	84,0	55,4	55,3
Rural	52,7	40,1	5,3
Vehicle in the household	<i>p</i> <0,001	<i>p</i> =0,220-> <i>n.s.</i>	<i>p</i> <0,001
No	55,9	(42,6)	11,1
Yes	75,7	(48,6)	24,8

n.s.= statistically non-significant

5.3. Logistic regression analyses

5.3.1. Antenatal care for women

The results of the logistic regression analyses for women's ANC are presented in table 3. In the univariate analysis, number of male partners' children, educational level, occupation, wealth, religion, ethnicity, type of place of residence and having a vehicle were significantly associated with women's ANC utilization. However, when adjusted for other significant variables, men's education, occupation, wealth, ethnicity and type of place of residence remained significant predictors for utilization of this component of maternal health care.

The odds for ANC seeking was 3,5-fold among partners of highly educated men compared to partners of uneducated men. Clerical occupation appeared as the strongest predictor of ANC utilization; the spouses were 15 times more likely to use ANC in comparison with spouses of men without formal employment. Belonging to the highest wealth quintile was associated with women's ANC four times more often than belonging to the lowest quintile. Looking at the ethnical background, Tigrie men's spouses were 12 times more likely to seek care than Affar men's spouses. It seems that the utilization might be lowest among Welaita and Somalie men's partners but the results can't be confirmed for them being statistically insignificant. Finally, the odds for urban dwellers' spouses was double compared to rural counterparts.

Table 3. Odds Ratios and adjusted Odds Ratios (95 % CI) for women's antenatal care by male partners' background characteristics

Socio-demographic characteristic	OR (95 % CI)	Adjusted OR (95 % CI)
Age	<i>p=0,090 ->n.s.</i>	
15-24	1,04 (0,79-1,37)	
25-34	1,24 (1,04-1,49)	
35-44	1,18 (0,98-1,43)	
45-59	1,00	
Marital status	<i>p=0,544 ->n.s.</i>	
Married	1,28 (0,81-2,01)	
In union	1,34 (0,78-2,30)	
Not married/in union	1,00	
Number of children	<i>p<0,001</i>	<i>p=0,296->n.s.</i>
1-2	1,71 (1,30-2,24)	0,73 (0,51-1,06)
3-5	1,14 (0,87-1,48)	0,70 (0,49-1,01)
6-10	1,01 (0,77-1,33)	0,75 (0,52-1,07)
11 or more	1,00	1,00

Educational level	<i>p</i> <0,001	<i>p</i> <0,001
No education	1,00	1,00
Primary	2,13 (1,86-2,43)	1,65 (1,38-1,97)
Secondary	5,74 (4,08-8,07)	2,95 (1,77-4,94)
Higher	8,50 (5,58-12,95)	3,53 (1,70-7,33)
Occupation	<i>p</i> <0,001	<i>p</i> =0,001
Not working	1,00	1,00
Professional/technical/managerial	9,33 (4,87-17,89)	5,16 (2,03-13,09)
Clerical	25,90 (7,08-94,76)	15,15(1,71-134,06)
Sales	6,94 (3,82-12,61)	4,79 (2,07-11,07)
Agriculture-employee	2,22 (1,28-3,84)	2,80 (1,26-6,22)
Services	15,11 (6,03-37,87)	7,93 (2,19-28,72)
Skilled manual	9,57 (5,09-17,99)	3,48 (1,44-8,37)
Unskilled manual	6,47 (2,77-15,15)	2,58 (0,86-7,77)
Wealth index	<i>p</i> <0,001	<i>p</i> <0,001
Poorest	1,00	1,00
Poorer	1,98 (1,65-2,39)	1,67 (1,32-2,11)
Middle	2,48 (2,05-2,99)	1,96 (1,53-2,51)
Richer	3,72 (3,05-4,53)	2,77 (2,14-3,59)
Richest	12,02 (9,44-15,30)	3,78 (2,58-5,53)
Religion	<i>p</i> <0,001	<i>p</i> =0,255 -> <i>n.s.</i>
Orthodox	1,00	1,00
Catholic	0,91 (0,42-1,97)	1,81 (0,45-7,26)
Protestant	0,64 (0,53-0,77)	1,50 (1,01-2,22)
Muslim	0,50 (0,43-0,58)	1,19 (0,92-1,56)
Traditional	0,22 (0,12-0,40)	2,05 (0,74-5,66)
Ethnicity (10 biggest groups)	<i>p</i> <0,001	<i>p</i> <0,001
Affar	1,00	1,00
Amhara	4,00 (2,97-5,37)	2,64 (1,77-3,95)
Gamo	4,58 (2,48-8,47)	2,20 (1,02-4,77)
Guragie	37,32 (15,71-88,65)	8,85 (3,51-22,33)
Hadiya	5,15 (2,59-10,25)	2,05 (0,90-4,67)
Oromo	3,85 (2,90-5,11)	2,06 (1,47-2,89)
Sidama	2,41 (1,55-3,73)	1,34 (0,73-2,45)
Somalie	1,27 (0,90-1,79)	0,82 (0,56-1,20)
Tigrie	13,27 (9,15-19,24)	12,08 (7,50-19,47)
Welaita	2,43 (1,46-4,04)	0,81 (0,42-1,59)
Type of place of residence	<i>p</i> <0,001	<i>p</i> =0,002
Urban	6,27 (4,96-7,93)	1,90 (1,27-2,85)
Rural	1,00	1,00
Vehicle in the household	<i>p</i> <0,001	<i>p</i> =0,524-> <i>n.s.</i>
No	1,00	1,00
Yes	1,93 (1,38-2,71)	0,85 (0,52-1,40)

n.s.= statistically non-significant

5.3.2. Male partners' participation in antenatal care

In univariate analysis, men's age, number of offspring, education, occupation, wealth, ethnicity and place of residence were significantly associated with their participation in antenatal visits (table 4). Again, adjusting for other significant factors altered the picture, and only men's occupational and ethnical background could be interpreted as predictors for their participation. Men in service work were six times more likely to accompany their partners to antenatal clinics than men outside the formal work market. Looking at the ethnicity, Affar men seemed to be the most active participators and Hadiya and Sidama men the least active, the difference being 7-fold.

Table 4. Odds Ratios and adjusted Odds Ratios (95 % CI) for male partners' participation in antenatal care by their background characteristics

Socio-demographic characteristic	OR (95 % CI)	Adjusted OR (95 % CI)
Age	<i>p</i> <0,001	<i>p</i> =0,364 -> <i>n.s.</i>
15-24	2,04 (1,40-2,96)	1,51 (0,89-2,58)
25-34	1,45 (1,13-1,85)	1,09 (0,76-1,58)
35-44	1,19 (0,92-1,53)	1,01 (0,73-1,39)
45-59	1,00	1,00
Marital status	<i>p</i> =0,526 -> <i>n.s.</i>	
Married	1,09 (0,57-2,06)	
In union	0,86 (0,41-1,82)	
Not married/in union	1,00	
Number of children	<i>p</i> <0,001	<i>p</i> =0,071 -> <i>n.s.</i>
1-2	1,78 (1,23-2,59)	0,87 (0,50-1,51)
3-5	0,95 (0,66-1,39)	0,65 (0,39-1,09)
6-10	0,99 (0,67-1,45)	0,73 (0,45-1,19)
11 or more	1,00	1,00
Educational level	<i>p</i> <0,001	<i>p</i> =0,102 -> <i>n.s.</i>
No education	1,00	1,00
Primary	1,23 (1,03-1,48)	1,14 (0,91-1,43)
Secondary	2,47 (1,81-3,39)	1,59 (1,05-2,41)
Higher	2,84 (2,04-3,97)	1,69 (0,98-2,91)
Occupation	<i>p</i> <0,001	<i>p</i> =0,012
Not working	1,00	1,00
Professional/technical/managerial	3,46 (1,29-9,30)	4,81 (1,26-18,31)
Clerical	2,69 (0,86-8,49)	4,06 (0,92-18,00)
Sales	1,75 (0,67-4,59)	3,47 (0,95-12,61)
Agriculture-employee	1,09 (0,43-2,78)	2,61 (0,72-9,51)
Services	3,93 (1,32-11,73)	5,72 (1,39-23,50)
Skilled manual	2,89 (1,09-7,65)	5,34 (1,45-19,68)

Unskilled manual	1,53 (0,49-4,79)	3,83 (0,89-16,55)
Wealth index	<i>p</i> <0,001	<i>p</i> =0,623 -> <i>n.s.</i>
Poorest	1,00	1,00
Poorer	1,00 (0,76-1,33)	1,21 (0,86-1,70)
Middle	1,07 (0,81-1,41)	1,24 (0,87-1,75)
Richer	1,09 (0,83-1,42)	1,31 (0,93-1,85)
Richest	2,00 (1,56-2,56)	1,28 (0,84-1,95)
Religion	<i>p</i> =0,241 -> <i>n.s.</i>	
Orthodox	1,00	
Catholic	0,50 (0,19-1,32)	
Protestant	0,84 (0,67-1,06)	
Muslim	0,84 (0,70-1,01)	
Traditional	0,84 (0,31-2,27)	
Ethnicity (10 biggest groups)	<i>p</i> <0,001	<i>p</i> <0,001
Affar	1,00	1,00
Amhara	0,47 (0,28-0,78)	0,36 (0,20-0,64)
Gamo	0,26 (0,11-0,60)	0,23 (0,10-0,55)
Guragie	0,37 (0,20-0,70)	0,24 (0,12-0,48)
Hadiya	0,18 (0,07-0,44)	0,14 (0,05-0,38)
Oromo	0,24 (0,14-0,39)	0,19 (0,11-0,33)
Sidama	0,15 (0,07-0,32)	0,15 (0,07-0,33)
Somalie	0,35 (0,19-0,63)	0,30 (0,16-0,57)
Tigrie	0,23 (0,13-0,39)	0,22 (0,12-0,39)
Welaita	0,27 (0,12-0,60)	0,20 (0,09-0,48)
Type of place of residence	<i>p</i> <0,001	<i>p</i> =0,770 -> <i>n.s.</i>
Urban	1,94 (1,60-2,34)	1,06 (0,72-1,55)
Rural	1,00	1,00
Vehicle in the household	<i>p</i> =0,105 -> <i>n.s.</i>	
No	1,00	
Yes	1,35 (0,94-1,94)	

n.s.= statistically non-significant

5.3.3. Institutional delivery

In the univariate model, all the studied background characteristics were significantly associated with place of birth of respondents' most recent child, as can be seen in table 5. After adjusting for other socio-demographic factors, number of children, education, occupation, wealth, ethnicity and place of residence remained significant explanatory factors.

Partners of men with no more than two children were nearly three times more likely to deliver in an institute than partners of men with more than ten children. Interestingly, the adjusted odds for highly educated men's partners to have given birth in an institute is only double compared to uneducated

men's partners, while the difference in crude figures is 19-fold. Regarding to the occupation, the only statistically significant difference was found between agricultural employees' and not working men's spouses, the former being about 60 % less likely to deliver in an institute. Similarly with education, the crude and adjusted figures for wealth differed very much; the adjusted odds for richest men's spouses was 3,5-fold compared to the poorest men's partners. This time, Guragie men's partners had the highest utilization of maternal services among the ethnical groups, 5-fold compared to Affar men's partners if only significant results are looked at. Urban residing was four times more strongly associated with institutional delivery than rural residing.

Table 5. Odds Ratios and adjusted Odds Ratios (95 % CI) for institutional delivery by male partners' background characteristics

Socio-demographic characteristic	OR (95 % CI)	Adjusted OR (95 % CI)
Age	<i>p</i> <0,001	<i>p</i> =0,486 -> <i>n.s.</i>
15-24	1,48 (1,00-2,17)	0,72 (0,37-1,41)
25-34	1,74 (1,33-2,27)	0,80 (0,49-1,30)
35-44	1,28 (0,96-1,69)	0,72 (0,46-1,11)
45-59	1,00	1,00
Marital status	<i>p</i> <0,001	<i>p</i> =0,503 -> <i>n.s.</i>
Married	0,57 (0,34-0,98)	1,33 (0,60-2,95)
In union	1,39 (0,74-2,58)	1,76 (0,66-4,67)
Not married/in union	1,00	1,00
Number of children	<i>p</i> <0,001	<i>p</i> <0,001
1-2	5,74 (3,46-9,53)	2,75 (1,18-6,37)
3-5	1,99 (1,19-3,34)	1,38 (0,62-3,07)
6-10	1,17 (0,68-2,00)	1,26 (0,58-2,74)
11 or more	1,00	1,00
Educational level	<i>p</i> <0,001	<i>p</i> =0,003
No education	1,00	1,00
Primary	2,46 (1,98-3,05)	1,10 (0,81-1,50)
Secondary	13,69 (10,08-18,60)	2,32 (1,43-3,76)
Higher	19,49 (14,05-27,04)	2,02 (1,09-3,74)
Occupation	<i>p</i> <0,001	<i>p</i> <0,001
Not working	1,00	1,00
Professional/technical/managerial	4,20 (2,06-8,54)	1,29 (0,46-3,61)
Clerical	7,96 (3,15-20,06)	1,21 (0,33-4,46)
Sales	2,87 (1,44-5,70)	0,89 (0,34-2,30)
Agriculture-employee	0,29 (0,15-0,56)	0,37 (0,14-0,95)
Services	6,10 (2,69-13,87)	0,89 (0,28-2,79)
Skilled manual	5,10 (2,54-10,27)	1,01 (0,38-2,69)

Unskilled manual	3,80 (1,61-8,95)	0,90 (0,28-2,86)
Wealth index	<i>p</i> <0,001	<i>p</i> <0,001
Poorest	1,00	1,00
Poorer	1,82 (1,23-2,68)	2,08 (1,28-3,40)
Middle	1,52 (1,01-2,30)	1,41 (0,83-2,42)
Richer	2,41 (1,66-3,52)	1,71 (1,03-2,84)
Richest	29,85 (21,74-41,00)	3,46 (2,00-5,97)
Religion	<i>p</i> <0,001	<i>p</i> =0,504 ->n.s.
Orthodox	1,00	1,00
Catholic	0,70 (0,27-1,85)	5,86 (0,57-59,71)
Protestant	0,43 (0,33-0,55)	1,02 (0,58-1,80)
Muslim	0,51 (0,42-0,61)	0,85 (0,60-1,21)
Traditional	0,00 (0,00-)	0,00 (0,00-)
Ethnicity (10 biggest groups)	<i>p</i> <0,001	<i>p</i> <0,001
Affar	1,00	1,00
Amhara	6,01 (3,48-10,37)	2,27 (1,10-4,68)
Gamo	1,88 (0,65-5,42)	0,64 (0,16-2,54)
Guragie	32,00(16,46-62,22)	5,04 (2,16-11,78)
Hadiya	1,81 (0,57-5,72)	0,59 (0,13-2,56)
Oromo	3,23 (1,87-5,57)	1,76 (0,90-3,46)
Sidama	0,61 (0,20-1,88)	0,52 (0,13-2,09)
Somalie	1,74 (0,92-3,30)	0,98 (0,46-2,06)
Tigrie	3,86 (2,16-6,90)	2,38 (1,09-5,20)
Welaita	2,62 (1,13-6,08)	0,59 (0,17-1,98)
Type of place of residence	<i>p</i> <0,001	<i>p</i> <0,001
Urban	23,46 (19,12-28,79)	4,06 (2,72-6,08)
Rural	1,00	1,00
Vehicle in the household	<i>p</i> <0,001	<i>p</i> =0,623 ->n.s.
No	1,00	1,00
Yes	3,03 (2,19-4,19)	1,14 (0,68-1,92)

n.s.= statistically non-significant

5.3.4. Institutional delivery: stratified analysis by type of place of residence

In urban data, all the explanatory variables were significant in the univariate analysis. After adjusting for other socio-demographic variables, number of children, education, wealth and ethnicity turned out to be the significant predictors for place of birth of respondents' most recent child. The results are presented in table 6.

The likelihood to deliver in an institute was even 50-fold for partners of men with only one or two children compared to partners of men with more than ten children. Education divided the urban population less dramatically, the difference was 3-fold between the most and least educated men's

spouses. What comes to wealth, the results were significant only concerning the two wealthiest groups and the richest men's partners were five times more likely to deliver in a health facility than the adjacent group's counterparts. Ethnical background made a marked difference: The odds for Guragie men's partners for institutional delivery was 21-fold compared to Affar men's partners, and there was also 7-fold difference between as well Amhara and Oromo representatives' spouses compared to Affar counterparts.

In rural data, age, number of children, education, occupation, wealth and ethnicity were significant background factors for place of delivery in the univariate model. When these variables were adjusted for each other, occupation, wealth and ethnicity remained the significant explanators (table 6).

Unskilled manual workers' partners were six times more likely to give birth in a health facility compared to agriculture-employees' partners, the other comparisons between the occupational categories were insignificant. The difference between the spouses of the richest and poorest rural men for institutional delivery was 3-fold. In this case, the ethnicity did not matter very much; only one significant difference was found between the groups: Tigrie men's partners were twice more likely to give birth in an institute than Affar men's partners.

Thus, the characteristics of men that predicted their spouses' institutional delivery differed between urban and rural settings. The common explanators were wealth and ethnicity, though a distinct ethnical background was behind the highest utilization in urban and rural areas.

5.3.5. Institutional delivery: interaction analysis

The only variable that appeared to be statistically significant in the interaction analysis was number of children ($p=0,003$).

Table 6. Stratified logistic regression analysis, Odds Ratios and adjusted Odds Ratios (95 % CI) for institutional delivery by male partners' background characteristics in urban and rural areas

Socio-demographic characteristic	Urban		Rural	
	OR	Adjusted OR	OR	Adjusted OR
<i>Age</i>	<i>p=0,046</i>	<i>p=0,340->n.s.</i>	<i>p=0,005</i>	<i>p=0,518 ->n.s.</i>
15-24	1,32 (0,59-2,99)	0,36 (0,11-1,24)	2,11 (1,23-3,62)	1,26 (0,53-2,97)
25-34	1,69 (1,03-2,77)	0,54 (0,24-1,19)	1,55 (1,02-2,36)	1,26 (0,65-2,45)
35-44	1,08 (0,65-1,80)	0,56 (0,27-1,15)	1,07 (0,68-1,69)	0,88 (0,50-1,55)
45-59	1,00	1,00	1,00	1,00

Marital status	<i>p</i> =0,027	<i>p</i> =0,923 -> <i>n.s.</i>	<i>p</i> =0,515-> <i>n.s.</i>	
Married	1,00	1,00	1,00	
In union	2,22 (1,15-4,31)	0,94 (0,43-2,05)	1,27 (0,65-2,46)	
Not married/in union	2,03 (0,73-5,62)	1,26 (0,36-4,45)	0,52 (0,13-2,15)	
Number of children	<i>p</i> <0,001	<i>p</i> <0,001	<i>p</i> <0,001	<i>p</i> =0,091 -> <i>n.s.</i>
1-2	1,00	1,00	1,00	1,00
3-5	0,31 (0,22-0,45)	0,44 (0,26-0,76)	0,46 (0,33-0,63)	0,60 (0,39-0,92)
6-10	0,16 (0,10-0,26)	0,20 (0,10-0,42)	0,44 (0,31-0,63)	0,83 (0,47-1,46)
11 or more	0,04 (0,01-0,16)	0,02 (0,00-0,20)	0,55 (0,32-0,97)	0,98 (0,39-2,46)
Educational level	<i>p</i> <0,001	<i>p</i> =0,021	<i>p</i> <0,001	<i>p</i> =0,291 -> <i>n.s.</i>
No education	1,00	1,00	1,00	1,00
Primary	2,96 (1,87-4,69)	1,46 (0,78-2,76)	1,29 (0,97-1,72)	1,04 (0,73-1,48)
Secondary	6,43 (3,69-11,20)	2,75 (1,30-5,80)	3,03 (1,69-5,43)	2,11 (0,97-4,59)
Higher	7,02 (3,94-12,49)	3,12 (1,23-7,96)	7,17(4,24-12,13)	1,48 (0,56-3,93)
Occupation	<i>p</i> <0,001	<i>p</i> =0,321 -> <i>n.s.</i>	<i>p</i> <0,001	<i>p</i> <0,001
Not working	0,85 (0,26-2,75)	3,35 (0,70-16,08)	0,24 (0,04-1,39)	0,30 (0,03-2,77)
Professional/techn./manag.	2,20 (1,01-4,83)	1,19 (0,37-3,82)	1,18 (0,30-4,63)	0,74 (0,12-4,55)
Clerical	2,83 (0,93-8,67)	1,10 (0,26-4,70)	2,08 (0,38-11,48)	0,67 (0,07-6,63)
Sales	1,39 (0,68-2,82)	1,14 (0,48-2,71)	0,47 (0,12-1,84)	0,40 (0,07-2,25)
Agriculture-employee	0,35 (0,15-0,80)	0,54 (0,19-1,49)	0,19 (0,05-0,71)	0,16 (0,03-0,85)
Services	2,25 (0,92-5,48)	1,57 (0,49-5,09)	0,00 (0,00-)	0,00 (0,00-)
Skilled manual	2,03 (0,98-4,18)	1,33 (0,56-3,17)	0,51 (0,12-2,19)	0,40 (0,06-2,47)
Unskilled manual	1,00	1,00	1,00	1,00
Wealth index	<i>p</i> <0,001	<i>p</i> =0,008	<i>p</i> <0,001	<i>p</i> =0,002
Poorest	0,09 (0,03-0,23)	0,41 (0,11-1,51)	0,20 (0,12-0,32)	0,29 (0,15-0,56)
Poorer	0,07 (0,01-0,60)	0,37 (0,04-3,87)	0,38 (0,24-0,61)	0,67 (0,37-1,21)
Middle	0,26 (0,06-1,08)	0,19 (0,02-1,89)	0,30 (0,19-0,49)	0,50 (0,27-0,92)
Richer	0,12 (0,06-0,23)	0,20 (0,08-0,52)	0,46 (0,29-0,73)	0,67 (0,38-1,20)
Richest	1,00	1,00	1,00	1,00
Religion	<i>p</i> <0,001	<i>p</i> =0,127-> <i>n.s.</i>	<i>p</i> =0,171-> <i>n.s.</i>	
Orthodox	1,00	1,00	1,00	
Catholic	*	*	1,90 (0,64-5,59)	
Protestant	0,46 (0,28-0,77)	1,62 (0,62-4,19)	0,77 (0,52-1,13)	
Muslim	0,47 (0,34-0,67)	0,67 (0,39-1,16)	0,74 (0,55-1,00)	
Traditional	**	**	0,00 (0,00-)	
Ethnicity (10 biggest gr.)	<i>p</i> <0,001	<i>p</i> =0,005	<i>p</i> =0,011	<i>p</i> =0,009
Affar	1,00	1,00	1,00	1,00
Amhara	18,49(4,07-84,12)	6,93 (1,29-37,26)	1,83 (0,97-3,44)	1,78 (0,84-3,75)
Gamo	7,00 (0,92-53,23)	1,93 (0,20-18,69)	0,45 (0,06-3,52)	0,44 (0,05-3,76)
Guragie	37,55 (7,47-188,85)	20,63(3,57-119,02)	2,47 (0,66-9,28)	1,96 (0,47-8,15)
Hadiya	7,00 (0,79-61,98)	1,82 (0,16-20,36)	0,53 (0,07-4,20)	0,34 (0,04-3,02)
Oromo	11,32 (2,50-51,37)	6,92 (1,33-35,93)	1,37 (0,74-2,53)	1,16 (0,56-2,43)
Sidama	*	*	0,50 (0,14-1,80)	0,40 (0,10-1,55)
Somalie	3,23 (0,66-15,74)	4,18 (0,75-23,36)	0,87 (0,39-1,94)	0,74 (0,31-1,77)
Tigrie	11,90 (2,45-57,84)	5,58 (0,92-33,75)	2,34 (1,22-4,51)	2,18 (1,02-4,66)
Welaita	8,17 (1,30-51,40)	2,22 (0,25-19,44)	0,94 (0,26-3,40)	0,73 (0,18-2,93)
Vehicle in the household	<i>p</i> =0,016	<i>p</i> =0,150 -> <i>n.s.</i>	<i>p</i> =0,172-> <i>n.s.</i>	
No	1,00	1,00	1,00	
Yes	2,09 (1,15-3,82)	1,80 (0,81-4,00)	1,56 (0,82-2,95)	

n.s.= statistically non-significant *=only 1 representative, irrelevant result **=no representatives

6. Discussion

6.1. Summary of the results

The aim of this study was to examine how male partners' socio-demographic background is associated with maternal health care utilization in Ethiopia. Women's antenatal care utilization, delivery care utilization and men's participation in antenatal check-ups were the components of maternal health care under investigation. Two additional analyses were conducted to find out whether there are differences in socio-demographic factors that shape the use of delivery services in urban and rural areas.

The results of this study on the coverage of maternal health care services are roughly in line with the outcomes of the female data of the same survey, EDHS 2011: According to the data gathered from men, 57 % of women had at least one antenatal visit (compared to 43 % in female data) and 12 % delivered in an institute (compared to 10 % when asked from women themselves) (CSA & ICF, 2012). The inconsistency in the ANC figures might be due to difficulty of remembering undramatic events such as antenatal care and which men might not have participated themselves.

This study shows that men's socio-demographic characteristics are strongly associated with maternal health care utilization in Ethiopia. More specifically, the number of offspring men have, their education, occupation, wealth, ethnicity and type of place of residence are factors that independently (when confounding of other factors has been taken into account) explain the differences in their spouses' health care seeking behavior as in their own participation in ANC. However, only occupation and ethnicity were common predictors for all the three components of maternal health care utilization.

Smaller number of children, higher level of education, higher wealth and urban residence were associated with better service utilization. Regarding to the occupation, clerical and service work were behind the highest ANC utilization while the lowest use and participation was among men outside the formal job market and their partners. Still, interestingly, the spouses of not working men were more likely to have an institutional delivery than the spouses of agricultural employees. The results concerning the ethnical background are ambiguous and the highest utilization was connected to a different ethnical group in each of the three cases: Tigrie and Guragie backgrounds predicted the best service utilization in women's antenatal and delivery care, respectively, and Affar background the

lowest utilization in both cases. Knowing those results it was surprising that the Affar men were the most active ones to accompany their partners in antenatal check-ups while Hadiya and Sidama men participated the least.

Examining the choice of place of delivery in urban and rural areas separately revealed that partly different factors seem to contribute to partner's institutional delivery in these settings (however, these results have to be considered as approximate ones for a weakness in the analysis explained below). In urban areas lower number of children, higher education and wealth, and Guragie ethnicity predicted better service use. In rural areas, in contrast, occupation as unskilled manual worker, Tigrie ethnicity and, similarly with urban setting, better wealth raised the likelihood of an institutional delivery. There was a huge 50-fold difference between the spouses of men with only 1 or 2 children and those with a very big family in urban areas, while in the countryside the number of men's children appeared to be an insignificant factor for the studied phenomenon. This discrepancy was consistent with the findings from the interaction analysis which indicated that among all the studied explanatory variables, number of offspring was the only factor that had a different influence on the choice of place of birth in these two areas. What comes to the assumption of Mekonnen & Asnaketch (2002) about the slight importance of socio-demographic factors in rural setting, the results of this study do not confirm that.

6.2. Pondering and comparison to previous studies

6.2.1. Descriptive analyses

First, a few reflections to the results of the descriptive analyses will be presented as some of the findings were dropped out of the final results (of the logistic regression analyses) for their insignificance. Regarding to the age, the highest utilization was most typically among spouses of men in the age category 25-34 years, and the lowest utilization of ANC was detected among spouses of the oldest participants. This was quite as expected and consistent with earlier findings (Regassa, 2011; Simkhada, et al., 2008); older people are more experienced and might think they do not need professional care, especially when constrained with other factors such as money and distance.

It was unexpected that men not in union were more likely to accompany their spouses to ANC than men living in union. To understand this outcome better, it should be known whether there is some concrete benefit for men following their partners, are they tested for HIV, for example. That could

explain why men who are not living with their partners are more eager to follow them to ANC controls –they want to get tested for having more or less casual relationship. Furthermore, institutional delivery was lowest among married men’s spouses. A possible explanation for this could be that the ones outside marriage are younger than the general population (96 % are married), and for being more inexperienced seek health care more often.

Orthodox religion was in each case behind the highest utilization. This finding is contradictory to a previous result from Ethiopia that suggests Muslim background to contribute to the highest ANC utilization (Mekonnen & Asnaketch, 2002). The most worrisome group was the partners of traditional religion believers that had the lowest utilization in all of the three cases; a result that is not surprising itself as people practicing traditional religions are likely to maintain other traditions, as well. Still, it was surprising that none of the partners of this group’s representatives delivered in an institute.

Having a vehicle in the household was associated with markedly increased ANC utilization and institutional delivery figures; an outcome that was highly anticipated in the setting where long distances are reality for most of the inhabitants (WHO, 2002). Unfortunately, only few of Ethiopian expectant mothers benefit of this transport option as in only 3 % of the households there was a vehicle.

6.2.2. Logistic regression

In general, the differences between the crude and adjusted ORs were big. This tells that confounding was present in the analyses, i.e. other factors distorted the analyses so that the estimates of the effect appeared too high or too low before the adjustment.

Occupation

The fact that occupation and employment status turned out to be independent predictors for all the three maternal health care components was partly unexpected when comparing to previous studies from Ethiopia and similar settings. However, it has to be remembered that this time the phenomena were examined through the male perspective. When comparing to the few studies on men dealing with maternal health care utilization, this result seems mostly consistent (Ditekemena, et al., 2012; Onah, et al., 2006). The finding that the spouses of not working men were more likely to deliver in an institute than the spouses of agricultural employees was surprising. One possible explanation is that men in the agricultural labor work very long days and are, thus, not able to transport or accompany their spouses to the clinics.

Ethnicity

Without having a better understanding of Ethiopian ethnic groups, the results concerning the ethnicity are difficult to interpret. Tigrie people are mainly farmers and pastoralist, and majority of them belong to the Orthodox church. In addition, Tigrayan People's Liberation Front is the striving force in the dominant party of Ethiopia currently. (Joshua Project, 2013; Wikipedia, 2013) These factors may contribute to the finding about higher utilization of maternity services among Tigrie men's partners compared to the other groups.

The lowest utilization was associated many times with Affar ethnicity (some other groups had lower, but statistically insignificant rates). Of the men themselves, Hadiya and Sidama participated the least in ANC. Most of the Affars are nomads who herd animals. Among them, Islam is the major religion though many pre-Islamic beliefs and customs exist, as well, e.g. certain trees and groves are believed to have sacred powers. (Joshua Project, 2013) The tendency of not using professional health services can be attributed to these kinds of traditional beliefs, among other possible explanations.

Number of children (Total number of children ever born)

Number of children was a predictor only for choice of place of birth, and furthermore, it seems to be a significant factor only in urban areas, yet very important. The finding that lower number of children contributes to partner's institutional delivery is highly consistent with earlier studies conducted on Ethiopian women (Amano, et al., 2012; Mekonnen & Asnaketch, 2002; Mulumebet, et al., 2011). This tendency can be understood so that parents with fewer children lack experience and thus, seek more easily professional care. In addition, the first deliveries tend to be more difficult than the later ones and that might motivate women (and the ones to decide) for institutional delivery.

Education

Expectedly, higher education of men contributed to partner's higher service utilization. However, regarding the seeking of delivery care, education seems to influence the behavior only in urban areas. The positive effect of education on maternal health care utilization has been documented widely in studies from Ethiopia and elsewhere (Abosse, 2010; Addai, 2006; Amano, et al., 2012; Anwar, et al., 2006; Babalola & Fatusi, 2009; Mahabub-Ul-Osubor, et al., 2006; Mekonnen & Asnaketch, 2002; Mulumebet, et al., 2011; Regassa, 2011; Sein, 2012; Simkhada, et al., 2008). Better educated people tend to be more aware of the benefits of professional health care than less educated people are. However, based on the former literature, the influence of education was relatively modest; in case of

place of birth there were only two-fold differences between partners of men with secondary and no education. Again, it has to be kept in mind that comparisons to studies investigating female characteristics are not straightforward. Lastly, it was surprising that education was not among the predictors for men's participation in antenatal visits.

Wealth

Compared to previous research in Ethiopia, the importance of men's wealth to partner's utilization of maternal health care was unexpected. In none of the reviewed studies wealth appeared as a significant, independent predictor. Looking at the findings from other developing countries, Simkhada, et al. (2008) reported that in many of the studies of their systematic review, standard of living was found to influence women's ANC use but for the weakness of the work, it did not point out studies in which the independency of the factors had been investigated. As Addai (2000) and Leslie and Gupta (1989) have argued, factors such as education might mediate the effect of wealth on health outcomes, i.e. at least part of the effect that wealth seems to have is due to other characteristics (e.g. better education) that richer people often possess. It seems that looking from the male perspective, this presumption may not be valid. It makes sense that being wealthier is connected to better utilization of services as it indicates better access; e.g. ability to finance the transport to a health facility and to pay for possible user fees.

Type of place of residence

As could be anticipated, urban residing predicted higher ANC and delivery care utilization than rural residing among spouses of the studied men. Especially concerning delivery care, this finding was consistent with earlier results from Ethiopia (Amano, et al., 2012; Mekonnen & Asnaketch, 2002; Mulumebet, et al., 2011). In the cities, health facilities are nearer and thus, easier to access than in the countryside. In addition, health centers and hospitals tend to be better resourced in the cities of less developed countries; there is more and better trained personnel, and many times more modern equipment and conditions, in general. These reasons may influence people's decisions to seek care from the facilities.

6.3. Alternative explanations for low utilization of maternal health care

6.3.1. Women's health care utilization

In addition to male partners' influence, many other factors have been proposed to interfere with the decision to seek maternal health care. Among them is naturally women's own characteristics and the level of autonomy women possess. In 13 % of Ethiopian households, women can independently decide about their health care use, and in most of the cases (62 %) the partners make the decision together (CSA & ICF, 2012). The contribution of women's socio-demographic characteristics has been widely discussed in the earlier pages of this work. Also other members of the family network like mother-in-law and sister-in-law might get involved in the decision-making, which has been reported from Ethiopia but likewise from other countries such as Nepal and Nicaragua (Lubbock & Stephenson, 2008; Simkhada, et al., 2010; Warren, 2010).

Culture-related habits and beliefs understandably have an effect to people's behavior. In Ethiopia, some traditions seem still to contribute relatively strongly to people's attitudes and health care seeking behaviors (Warren, 2010). Similar findings have been reported elsewhere, too (Adamu & Salihu, 2002; Lubbock & Stephenson, 2008). Based on her qualitative study about care seeking for maternal health, Warren (2010) concluded that the preference of Ethiopian women to deliver at home is at least partly due to will (of those who decide) to retain control of the process and to follow the traditions. In addition, delivering at home enables the presence of close relatives and friends. According to the study, in case of complications religious and traditional remedies (prayer, herbal solutions) are typically tried before referral to a health facility is considered. However, Warren also reminded that Ethiopian women are constrained by the distance and cost in reaching care, which has to be taken into account when analyzing their choices on the utilization of health services.

The quality of services and their availability have been found to influence maternal health care utilization (Lubbock & Stephenson, 2008; Simkhada, et al., 2008). Availability is an interesting concept and it does not necessarily coincide with the physical existence of a health institution. In low-resource settings, it is possible that the facility itself is in place but the personnel or some other essential component of the services (drugs, equipment) is missing. Poor availability can also be understood as long waiting times or inconvenient opening hours. Low quality of maternal health services in form of unclear communication from the health care workers, uncomfortable or rough

physical examinations and lack of attendance were among the factors that discouraged Nicaraguan women from seeking care at health facilities (Lubbock & Stephenson, 2008).

6.3.2. Obstacles for male participation

Especially in strongly patriarchal societies, conservative gender norms and other socio-cultural factors may hinder male involvement in maternal health care. Both men and women might be afraid of the social stigma associated with men's abnormal and "unmasculine" behavior (Kululanga, et al., 2012; Mullany, 2006). According to a qualitative study conducted in Malawi, men's role during spouse's pregnancy was mostly to provide financial and other material support and transport arrangements, which can be considered a traditional masculine role. What is interesting is that there was no perceived need for male participation by the community members but only from the part of the health sector. (Kululanga, et al., 2012)

Other barriers commonly mentioned are health service related factors. The health service organization for reproductive health is still female-oriented in many countries, also in Ethiopia, and there are calls for creating men-friendly services (Berhane, 2006). Factors such as inconvenient opening hours of services, unrespectful behavior of health providers and lack of space to accommodate male partners are likely to contribute to men's low participation in maternal health care (Ditekemena, et al., 2012).

6.4. Strengths and limitations of the study

The strengths and limitations of this study are mainly related to the data. The strengths include large sample size, national and regional representativeness of the results and relatively low amount of unknown values in the original data set as a result of meticulous data collection. One more advantage that can be pointed out is that the phenomenon in question has been explored quite widely; a look has been taken at three dimensions of maternal health care utilization and also several variables have been included to describe men's socio-demographic background thoroughly.

However, there are also quite many limitations to be mentioned. First, some important factors describing socio-demographic background and access to services were not available in the data, such as type of family (modern or extended) and distance to the health facility. Second, the information about

the number of ANC visits and the qualification of the attendant both in ANC and delivery care was missing. Hence, the comparisons to rates with skilled attendant are unreliable to some extent though we can assume that the personnel in health facilities and hospitals are mostly skilled. Third, study participants' relationship to the mother of the most recent child had not been asked (the mother is not necessarily the wife or partner living in the same household). Otherwise the influence of the socio-demographic characteristics of the parents, living in the same household, could have been compared because it is possible to connect these EDHS data. Fourth, the reliability of men's answers can be questioned to some extent as the study objects were asked about events they might not have participated themselves. Especially ANC visits may be difficult to remember if the man has not been present himself (43% participated in ANC).

An important weakness regarding to the stratified analysis was the small number of representatives in some classes, especially in urban data. This problem was pronounced with variables such as religion, ethnicity and occupation that had many classes, and in some classes there appeared to be only one or no representatives at all. As a consequence, the OR could not be computed or the confidence interval resulted very wide. Also many comparisons turned out to be insignificant. Thus, the results of the stratified analysis are not very deeply rooted and should be considered as approximate ones. This problem could have been overcome by combining classes but as the stratification was only an additional analysis, we abstained from doing that.

In addition to these data- or analysis-related limitations one further disadvantage has to be acknowledged: The author of this Master's thesis is familiar with Ethiopia and its circumstances only through the literature and information available in internet.

7. Conclusions and recommendations

The findings of this study about the contribution of men's socio-demographic characteristics to maternal health care utilization in Ethiopia should be taken into account when planning policies and programs to improve the current situation of low utilization. The fact that the vast majority of Ethiopian women give birth outside the facilities, often with difficult access to emergency care in case of complications, can be considered as one of the main causes for the heavy burden of maternal deaths in the country. Also antenatal care has an important role in promoting women's health though its effect on mortality reduction is less direct.

The study has identified several groups of Ethiopian male population whose spouses are likely to remain without professional maternal health care or who abstain from using the services. These groups comprise of lowly educated, unemployed, agricultural workers, poorest parts of the population, rural-dwellers, men with big families and certain ethnic populations. Planning the interventions, two main approaches are recommended: targeting the structures and increasing men's awareness.

First, the structural reasons should be focused, e.g. education, income and employment levels should be elevated. The previous are long-term processes that are closely linked to overall development and poverty reduction of the country and thus, do not offer help in the short run. Other structural interventions include improving the access and availability of maternal health services, especially in rural areas; a process that has already been launched under Health Sector Development Program but that should be enhanced. Second, as the results support the assumption of Ethiopian men being strongly involved in the decision-making regarding their spouses' utilization of health services, increasing men's awareness about the benefits of professional care is essential. This can be reached e.g. by male-targeted information campaigns, paying special attention to the population parts named above. Health sector should be in charge of the process and involve men strongly in reproductive health programs. However, to obtain a sustainable change, also other sectors have to be engaged.

In addition to men's characteristics, it's known that several other determinants might influence the decision to seek maternal health care services (partner's own socio-demographic background, extended family members' advices, previous experiences of health care and delivering, the quality of the services and various factors related to access). Consequently, this piece of study is not able to explain whole the

phenomenon but it helps to understand how men's background is related to it. In further studies the relative importance of all these factors, affecting the decision-making of this important issue, should be investigated.

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